MSC15-CS

https://www.gigahertz-optik.com/en-us/product/msc15-cs/

Product tags: VIS

Description

The circadian phototransduction process

Circadian phototransduction is the process that converts optical radiation incident on the retina into neuronal signals that reach the suprachiasmatic nucleus (SCN). The mechanism of circadian phototransduction can be viewed as a unique neuronal circuit in the retina with spectral sensitivity to optical radiation and a characteristic response to varying amounts of this optical radiation. Therefore, measurement of optical radiation and evaluation of it according to circadian effects is important.
According to Rea et al, modeling circadian phototransduction in humans requires a systematic and convergent approach to understand how a retinal circuit might perform this transformation.
Such a model was developed by the team and implemented in the MSC15-CS.

MSC15-CS for measurement of circadian stimulus, illuminance, spectrum and color

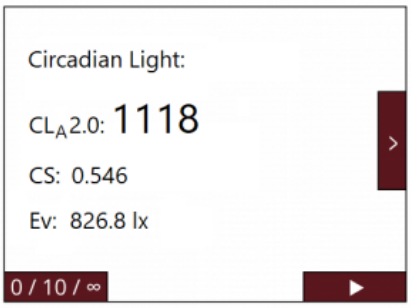
Circadian model implementation

The MSC15-CS is a spectral-measuring luxmeter which, in addition to all the features of the established MSC15 spectral light meter, additionally contains the circadian assessments according to:

Modeling Circadian Phototransduction: Quantitative Predictions of Psychophysical Data. By Rea, M. S., Nagare, R., and Figueiro, M. G. (2021). Front. Neurosci. 15:615322. doi: 10.3389/fnins.2021.615322

and the correction:

Corrigendum: Modeling Circadian Phototransduction: Quantitative Predictions of Psychophysical Data. by Rea, M. S., Nagare, R., and Figueiro, M. G. (2021). Front. Neurosci. 15:615322. doi: 10.3389/fnins.2022.849800



Circadian Display on MSC15-CS

The MSC15-CS - Compact spectral measuring circadian meter.

With the MSC15-CS Gigahertz-Optik GmbH has developed a spectral measuring light meter in the special version -CS which allows the circadian evaluation of light sources directly on site. The evaluated measurement results are displayed directly on the touch screen. A control by means of the supplied software and display of the measured values in this is also possible.
Technically, the instrument corresponds to the established MSC15 spectral light meter with its high accuracy, a spectral range from 360 nm to 830 nm, a low calibration uncertainty and accurate characterizations and corrections like non-linearity as well as bandwidth effects, etc.

Display of photopic lux, CCT and CRI Ra

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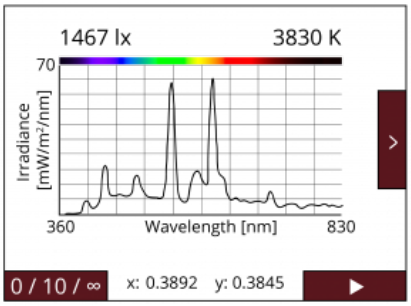
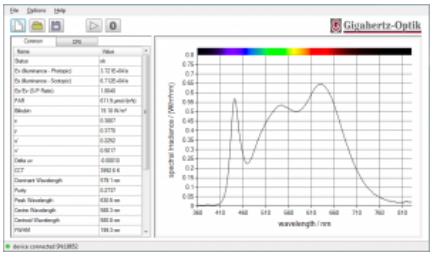


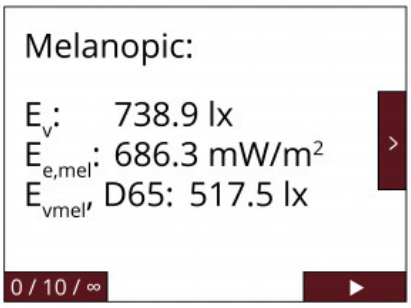
Display of the spectral power distribution, photopic lux and CCT



Calibration of the MSC15-CS Circadian Light Meter

One essential quality feature of photometric devices is their precise and traceable calibration. The MSC15-CS is calibrated by Gigahertz-Optik's calibration laboratory that is accredited by DAkkS (D-K-15047-01-00) for the *spectral responsivity* and *spectral irradiance* according to ISO/IEC 17025. Every device is supplied with its respective calibration certificate.

Example measurement in the MSC15's software



melanopic display

Software possibilities

In addition to the free user software, the software development kit is also available for users to integrate the meter into their own software.

Specifications

General	
Short description	Spectral circadian stimulus light meter
Main features	Mobile light meter, spectroradiometer 360 nm to 830 nm with a 10 nm optical bandwidth and additional optical bandwidth correction (CIE214), precise cosine field of view function (f_2), Lithium ion battery with over 8 operation hours and traceable calibration
Measurement range	1 lx to 350,000 lx, 360 nm to 830 nm
Typical applications	Precise spectral light meter for the lighting industry and all kind of applications
Calibration	Factory calibration. Traceable to international calibration standards.
Product	
MSC15	Handheld light meter for circadian stimulus, illuminance, spectral data and light color. Color-Touchscreen, simple intuitive Operation with clearly arranged display views. Storage of 10 measuring points and selection of different display views is possible. Extension of the MSC15. (Class B according DIN 5032-7 or AA according to JIS C 1609-1:2006)
Input optics	Diffuser window with 10mm diameter, cosine corrected field of view, f2 ≤ 3 %

Measured Quantity	Illuminance photopic Illuminance scotopic circadian evaluation Spectral Irradiance Color coordinates (x,y) CCT CRI (color rendering index) PAR– PPFD Melanopic irradiance Melanopic illuminance (equivalent melanopic lux) Melanopic daylight equivalent illuminance Total irradiance for bilirubin (Ebi) Average spectral irradiance for bilirubin (AAP) Other color quantities as well by software (x, y, u´, v´, X,Y,Z, delta uv, color temperature, color rendering index (CRI) Ra, R1-R15, TM-30-20, CQS, CIE-170, etc.)
Spectral Detector	
Spectral range	(360 - 830) nm
Optical Bandwidth	10 nm optical bandwidth correction applied according to CIE 214
Measurement range typ. white LED	(1 - 350000) lx
CCT Measurement range	(1700 - 17000) K
ΔCCT	± 50 K (standard illuminant type A, *k=2*) ± 3 MK^{-1} (Standard illuminant type A, *k=1*) ± 4% (depending on the LED spectrum, *k=2*)
Δy Δx uncertainty	± 0.002 (Standard illuminant A, *k=2*)
Repeatability	± 0.0002
Peak wavelength	± 1 nm
Calibration	
Calibration uncertainty	Illuminance (standard illuminant A, *k=2*) +/- 3% Illuminance (typ. LED, *k=2*) +/- 4% *(Traceable to national standard. Uncertainty of the standard is included.)*
Miscellaneous	
Interface	USB 2.0
Temperature range	Operation: 10°C to +30°C Storage: -10°C to +50°C
Power Supply	5VDC by USB
Power Supply	rechargeable battery 8h of operation (continuos measurement, 100% display backlight on) 13.5h of operation (one measurement, standy modus, 100% display backlight on) 30h of operation (one measurement, standby-modus, reduced display backlight to 10% (sufficient for indoor lighting conditions))

Display	Color Touchscreen
Weight	160 g
Dimensions	136 mm x 74 mm x 32 mm

Downloads

Type	Description	File-Type	Download
MSC15 Technical Datasheet	MSC15 brochure	pdf	https://www.gigahertz-optik.com/assets/Uploads/Technical-Datasheet-MSC15-210x297-EN-sheets.pdf
Brochure	Light measurement solutions for general and specialized lighting	pdf	https://www.gigahertz-optik.com/assets/Uploads-v2/generallighting-broschuere-DINA4-hoch-v2.pdf

Purchasing information

Article-Nr	Modell	Description
Product		
15316864	MSC15-CS	MSC15-CS spectral circadian stimulus light meter measurement device, USB cable, case for device and USB cable, S-MSC15 software as a download, calibration, Factory calibration certificate
15310290	KP-MSC15-E-S	Option: DIN EN ISO/IEC 17025:2018 Test Certificate (DAkkS) Spectral irradiance measurement in wavelength range from 360nm to 830nm.
Re-calibration		
15300569	K-MSC15-I	Calibration of the MSC15 including wavelength adjustment. Factory calibration certificate
15310249	KKP-MSC15-E-S	Factory Calibration Certificate with DIN EN ISO/IEC 17025:2018 Test Certificate.
Software		
15306347	S-SDK-MSC15	Software development kit

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- After-Sales Support
- Calibrations & Re-Calibrations (ISO/IEC 17025 Calibration Services, factory calibration, Calibration of Third-Party Products)
- Repairs & Updates
- OEM & Feasibility Consulting of Customized Solutions

Send us your inquiry or contact us by phone or e-mail. We would welcome your feedback too or review us on Google.

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